BEBR

FACULTY WORKING
PAPER NO. 1125

Integration as a Provider Response
to Shrinking Health Care Dollars

Richard J. Arnould
John W. Pollard
Charles B. Van Vorst

College of Commerce and Business Administration
Bureau of Economic and Business Research
University of Illinois, Urbana-Champaign

BEBR

FACULTY WORKING PAPER NO. 1125

College of Commerce and Business Administration

University of Illinois at Urbana-Champaign

March, 1985

Integration as a Provider Response to
Shrinking Health Care Dollars

Richard J. Arnould, Professor
Department of Economics

John W. Pollard
Carle Clinic Association

Charles B. Van Vorst
The Carle Foundation

This paper was prepared for presentation at the International Health Economics and Management Institute in Rome, Italy, March 9-14, 1985. Not to be quoted without permission of the authors.

Bibliography available upon request.

ABSTRACT

The health sector in the United States consists of various independent provider groups. Close functional relationships exist between many providers, such as, between physicians and hospitals. However, formal economic relationships between these provider groups have been almost nonexistent. This lack of economic coordination that has been the result of various types of third party payment mechanisms has resulted in inefficiencies in the provision of health care. Specifically, the physician-agent has prescribed health services to the patient while having little or no financial responsibility to the patient or other providers.

The authors argue that efficient health care delivery requires that payment mechanisms pass relevant financial risks to providers and consumers. these risks will provide incentives for consumers to seek efficient providers and for providers to deliver services efficiently.

A major source of gains in efficiency will result from the integration of health care providers. Vertical integration, in particular, will provide gains in technical efficiency, the reduction of contractual costs and gains in information economics. Examples are provided of how various types of integration will provide each of the types of gains in efficiency.

INTRODUCTION

The health care sector in the United States and in many other countries consists of various independent provider groups. Each group plays a highly segmented functional role in supplying health care services to consumers. A close functional relationship exists between many providers such as between physicians and hospitals. Many of these relationships are complimentary in nature and essential elements in providing certain types of health care. However, formal economic relationships between these provider groups, from limited contractual, contractual, to full integration through common ownership, have been almost nonexistent.

Various inefficiencies in providing total health care services have resulted from this lack of coordination and integration. These inefficiencies take many forms including overlapping responsibility, unnecessary duplication of facilities, unnecessary tests and services, misplacement of needed care, use of inefficient facilities, excess capacity, and limited quality control. In reality, these inputs are only intermediate factors used to promote improved health status. The ultimate well-being of the individual is the goal. Structural inefficiency exists when the disharmony occurs between means (inputs) and goals (health status).

Inefficiencies caused by an uncoordinated production and distribution system of health care services exist in

both decentralized economies such as the United States (Arnould and Van Vorst, forthcoming) and highly centralized economies such as Israel (Palley, Yishai and Ever-Hadani, 1983).

The most impelling cause of production and consumption inefficiencies in the United States has been the availability of public (Medicare and Medicaid) and private (Blue Cross/Blue Shield) insurance systems that transfer the financial risk associated with providing health care services to third party payors. The third party reimbursement system promoted the "codification" of the independent roles of provider groups. Providers of individual services were not linked in any economic manner with one another when rendering services to the same patient. No financial incentive to coordinate or include services existed. Communication among providers on basic patient-care related data was not formally established as an operating norm.

The federal government's policy statement of health care as a basic human right implied financial constraints that were not controlling. This philosophical approach of government, the largest individual purchaser of health care services, was consistent with the prevalent Judeo-Christian ethic in the United States of the sanctity and value of an individual life.

Thus, our health care system was built on a model with limited incentives for efficient resource utilization. The

cumulative result was a rapid escalation of total expenditures for health care services in the United States. In 1965, $41.7 billion or 6% of GNP was spent on health care in the United States. These costs had risen to $321.4 billion, or 10.2% of GNP in 1982. Total health care costs are expected to increase to over $462 billion by 1985 (U.S. Dept. HHS, various years). Clearly, some of this increase is the result of improved technology and changing demographic characteristics of the U.S. population. However, a significant component of these increased expenditures can be attributed to inefficiencies in the demand for and the supply of health care services.

This rapid increase in health care costs, coupled with major changes in the nation's economy, has caused a re-evaluation of the basic philosophical goals of health care and significant changes in the insurance systems in the private and public sectors. Both sectors have adopted more market-oriented approaches that shift part of the financial risk to providers and consumers. These changes will result in a substantial re-evaluation of the traditional roles, structures, and responsibilities of providers. Various forms of provider integration have begun, with more changes emerging rapidly. These changes will bring more commonality in the incentives of various provider groups. This is a recent and emerging phenomenon. Therefore, our discussion will provide a theoretical basis for health care provider integration, a documentation of certain types of

integration, and an assessment of certain gains in efficiency. Potential forms of integration depend upon the degree of efficiencies associated with various "linking" arrangements among providers. These efficiencies are difficult to measure and, therefore, long-run experimentation with different market forms will be necessary to test the ultimate gains through expanded provider integration.

This paper is divided into three sections. The next section describes the nature of production and consumption of health care services and identifies six groups of participants in these activities. The second section describes existing contractual relations between these participant groups and how changes in these relationships are changing the agent roles of providers. The third section describes types and sources of efficiency from integration.

NATURE OF PRODUCTION AND CONSUMPTION OF HEALTH CARE SERVICES

An understanding of the nature of production and consumption of health care services in the United States is essential to analyze past structural inefficiencies and the emerging role of provider integration. There are six broad groupings of participants that interact to provide health care services: government, consumers, insurers, first level providers, second level providers and third level providers.

1. Government exerts authority over the health care system at all levels in society. The federal government has

greatly expanded its activities as a purchaser of health care services through the enactment of Medicare and Medicaid. Cooperative planning efforts during the 1960's were strengthened in the 1970's through the passage of U.S. Government law PL 93-641 and the subsequent development of state Certificate of Need (CON) activities.

Tax treatment of health insurance premiums in the United States has eliminated the normal income effect of higher insurance prices on consumers and, thus, the incentive for the insurer to function as the efficiency control mechanism. Other government actions have bred a similar lack of efficiency incentives. Selective cost controls resulted in costs being transferred from regulated inputs to unregulated inputs, and from publicly reimbursed patients to privately insured patients. Subsidies to expand the number of physicians and hospital beds without controls on demand resulted in supply created demand.

The professions have used self-regulation to restrict infringement in their production areas by different types of cost-effective suppliers (Havighurst and King, 1983). Other forms of regulation (Sloan and Steinwald, 1980; Arnould and Van Vorst, forthcoming) have promoted the divergent interests of various input providers.

As long as purchasers' budgets expanded, health care service providers had no incentive to integrate to become more efficient. In the last decade attention has focused on the rapidly increasing resources being devoted to health

care. Employee health care costs were a factor in causing U.S. firms to lose their competitive edge in world markets. Rapidly escalating costs of government programs placed great strains on the federal budget. The aging U.S. population is increasing the number of people in the high medical cost category. The rapid increase in high-cost, technological life-improving developments further increased costs. Without changes in government policies, costs in this sector will continue to strain the economy.

The government established methods to control resource expenditures in health care. Professional Standards Review Organizations (PSRO), created to provide external review of procedures prescribed by physicians, have failed to control the elements under their jurisdiction, namely the types and units of services provided (Sloan and Steinwald, 1980). This failure is due in part to PSRO's having no authority over costs per unit of service.

Certificate of Need laws, established to reduce excess capacity by limiting the availability of services, have not effectively controlled costs. Finally, evidence shows that selective controls on certain inputs have controlled those inputs, but have resulted in higher overall costs because costs were shifted to other inputs. Thus, government actions have failed to negate the perverse effects of incentives generated by third party payment mechanisms.

2. Consumers are individuals who utilize health care services. There are two unique characteristics about the

production of health care services. First, the consumer provides substantial input into the production process in the form of information before the other inputs are prescribed (Arnould, 1972). This vertical interaction gives the physician information about the patients's health status and psychological state. Second, from this information the physician acts as an agent and prescribes the other inputs necessary to provide the desired health outcome (Arrow, 1963; Evans, 1983). Consumer knowledge of health care production is generally limited. The consumer may be able to identify symptoms, but is usually unable to diagnose the cause or draw together appropriate inputs to produce a desired result. The physician-agent determines what tests are needed, whether the problem can be treated with drugs or surgery, whether hospitalization is necessary and for how long, and whether specialists are required.

Typically agency relationships occur in single economic units where owners and managers have different objectives (Jensen and Meckling, 1976). Also, these relationships occur in markets where competition places some, if not ultimate, control over deviations of firm behavior from cost minimization and profit maximization. The agent relationship in health care encompasses two economic units - the consumer and one of the provider units. Evans (1983) argues that this is incomplete vertical integration because the relationship does not encompass economic or contractual relationships between the physician-agent and the consumer

or other input providers. Therefore, the agent-physician bears no financial risk for other inputs prescribed and has no financial responsibility to the consumer. Finally, the behavior of governments and insurers has removed competitive market forces that would place controls on the extent the agency behavior deviates from cost minimization behavior.

3. Third Party Payors provide the financing and insuring of health care services for various consumer groups. Third party payors consist of various government units, private insurers and self-insured employers. Over 40% of all U.S. health care expenditures were purchased by federal and state governments, largely for Medicare and Medicaid recipients. Similarly, Blue Cross/Blue Shield plans, which vary across states, accounted for about half of the private health insurance in force in the United States in the late 1970's. Thus, there has been a substantial amount of concentration in the insurance and third party markets.

Various forms of cost-plus pricing have been common in private and government insurance contracts. Prices have been retrospectively determined and based on fee-for-service pricing in which the results are actual costs plus a mark-up. To be efficient, cost-plus pricing requires the third party payor to control the cost of a unit of service and the number of units of each service provided. The contracts failed in both demands, resulting in a significant degree of moral hazard. Output limits were not clearly

delineated in insurance contracts. External cost monitoring such as by PSRO's, has been costly and oftentimes was done with incomplete information. The external monitors were not provided with tools to influence the incentives of providers. Thus, inefficient amounts of services were provided. Private and government third party payors have had the authority to audit the costs of providers. However, auditors usually had no independent method to determine true minimum cost levels. Thus, they resorted to comparing the cost of individual cases to industry-wide norms. Since no providers had incentives to minimize costs, the industry cost norms were based on inflated costs and units of service. Thus, costs per units may have been too high.

Prices paid for some services may have been set at artificially high levels for an additional reason. Many major private insurers have been controlled or significantly influenced by providers who control the reimbursement policies of those plans, but have no risk of plan default. Providers have used their control of plans to establish input prices and coverage levels that ultimately resulted in excess insurance coverage (Feldstein, 1973; Frech and Ginsburg, 1978), excessive and inefficient services being provided (Goldberg and Greenberg, 1977) and higher input costs, particularly physician fees (Arnould and DeBrock, forthcoming). An efficient market in which providers bear some financial default risks will force insurers to control utilization and price services competitively. Insurers and

providers unwilling to do so will find their prices to consumers increase and their market shares decline.

4. First Level Providers typically have initial agency relationship with the consumer. These providers are physicians usually in the primary care specialties of Family Practice, General Internal Medicine, Pediatrics and Obstetrics. There are approximately 202,117 licensed primary care physicians in the United States, over 148,655 of whom operate out of a solo practice model. First level providers have traditionally been the entree of the patient into the health care system and in earlier times represented the bulk of services available to the populace. The growth of specialization aided by tremendous gains in technology has changed the historical role of the primary care provider. Competition in health care markets and the development of prepaid and prospectively determined reimburement methods is increasing the importance of primary care prodivers in controlling utilization and developing these providers into a more formalized "gate-keeper" role.

5. Second Level Providers provide services which are utilized by the consumer under the direction of first level providers or as intermediate products to first level or other second level providers. Second level providers include the physician specialists, who, like level one physicians, are organized primarily as single practice providers. They number 299,841 and play an important role in bringing information/technology advances to medicine.

The largest expenditure of health care dollars for level two providers goes for hospital services. The hospital's relationship is with both level one and two physician-providers although this relationship normally does not contain an economic link or output control mechanism.

Traditional contractual relationships between health care providers were between the hospital and physician inputs in the form of practice privileges. These relationships limited the types of practice and procedures of physicians, but placed no limit on the output of either the hospital or physician. Direct agency relationships do exist in hospitals that are owned or controlled by physicians. Pauly and Redisch (1973) argue that physician control of hospitals results in the latter being operated as physician cooperatives and the agency role of the physicians induces the hospitals to operate according to policies that maximize physicians' incomes.

Other level two providers supply services for patient care as the hospital does, generally in an indirect role; these services are consumed upon prescription by the physician-agent, not purchased directly by the consumer. These providers include, but are not limited to:

*Specialty inpatient hospitals including psychiatric, rehabilitation, alcohol/substance abuse, etc.

*Extended inpatient care including skilled nursing, intermediate care, swing bed

programs, etc.

*Outpatient clinics

*Emergency response systems

*Psychosocial counseling

*Adult day care

*Day hospital

*Cardiac rehabilitation programs

*Outreach services including screening clinics, emergency centers and mobile diagnostic facilities

6. Third Level Providers typically are utilized directly by the consumer with minimal input from levels one and two, particularly physician-providers. Third level provideres supply a broad range of services designed to meet general health problems with a social focus on the individual as a member of society. Third level providers include, but are not limited to:

*Housing services including senior citizen apartments, assisted living, foster care and life care communities

*Home health services including Medicare certified and private in-home services, hospice, homemaker services and home infusion therapies

*Durable medical equipment including beds, walkers, oxygen equipment and related supplies

The six broad groupings outlined above provide a conceptual model of the various health care production entities. These definitions are not precise or limited. Dual roles are played between provider levels and other entities described. The pluralism of our current health care system and the lack of economic integration and coordination among its various components are evident.

This non-economically integrated system lacks a central unifying authority responsible for the efficient coordination of the various inputs. The physician-agent with a responsibility to the patient's health has no contractual obligation to see that these needs are met efficiently. Each unit prices and prescribes inputs to maximize its own utility function. Often that maximization process involves duplication of tests and other services such as information gathering and the unnecessary prescription of certain services, e.g., hospital admissions and extra days of care. Clearly, either integration will not cause increased efficiency or certain characteristics of health care markets have eliminated incentives for more efficient production. Strong evidence suggests that the latter is the appropriate conclusion.

CONTRACTUAL RELATIONSHIPS IN THE HEALTH CARE SECTOR

Contractual relations between consumers, third party payors and providers have been poorly defined and often open-ended. Consumers contract with third party payors to finance the purchase of health care services from providers.

The U.S. tax laws eliminate most concerns that consumers might have about increases in premiums in these contracts from year to year. On the other end of these relationships, the contracts between third party payors and providers have been very incomplete.

A complete contract must specify the prices, quantities and quality of the services to be provided. Contractual relations between third party payors and providers have been incomplete in all three categories. Providers have been reimbursed on the basis of retrospectively determined cost-plus prices for each individual unit of service provided. The costs were not necessarily minimum costs, and the prices may have been administered by provider influence over the third parties. Also, difficulties in specifying in the contract the number of units of each service necessary to treat a specific ailment, e.g., blood transfusions, days in hospital, and level of nurse care, have left the quantity dimension of the contract virtually open-ended. Finally, quality has been specified only loosely in terms of very general standards. These relationships are summarized in Figure 1.

The incompleteness of the consumer-third party and third party-provider contracts has permitted the physician-agent to pass on all financial risks to the third party, thereby generating the potential for a significant amount of moral hazard.

Purchasers of health care services in search of more efficient market-oriented health care systems are changing these contracts, especially those between third party payors and providers to close some of the open-endedness and shift financial risks to providers. The three most prominent types of contractual relationships developing in the United States are Health Maintenance Organizations (HMO's), the complete prepaid health plans; Prospective Payment Systems (PPS), where prices are based on an episode of a specific health problem rather than each unit of service provided; and Preferred Provider Arrangements (PPA), featuring direct purchase negotiations with providers. Each plan closes various loopholes in the previous contractual arrangements.

HMO's provide the most complete shift of risk from third party payors to providers. Purchasers of health care services (governments or private entities) contract with one source to provide all health care needs of a consumer group for a predetermined premium. This inclusive premium will be competitively determined if the HMO's must compete with other prepaid plans and health care provision systems for the contract. Further, most moral hazard will be eliminated because providers' revenues are fixed for the duration of the coverage period, usually one year. Thus, their incomes are maximized only if their costs are minimized.

Prospective Payment Systems (PPS) and Preferred Provider Arrangements (PPA) involve contractual arrangements between third party payors and providers in which prices for

services are determined prospectively. However, the dimensions of the units of services provided are defined differently among these contracts.

The most prominent PPS in the United States is the DRG system used to reimburse hospitals for services provided to Medicare recipients. Currently that system delineates units of health care services in terms of 468 diagnosis related groups (DRG's), each of which represents an illness or health problem. Hospital reimbursement for each DRG is based on secondary diagnosis, patient age, and sex in addition to the primary diagnosis. Physician, ancillary and outpatient services and hospital capital costs currently are not included in the system. If the hospital's cost of providing the services is less than the predetermined prices, the hospital keeps the surplus; if the costs are greater, the hospital suffers the loss. This system encourages hospitals to treat patients efficiently and to minimize ancillary service charges and lengths of stay. The system provides an incentive to close the price and quantity loopholes in fee-for-service contracts for each DRG treated. However, there is no incentive to reduce admissions and may be an incentive to use more highly reimbursed DRG's when secondary diagnoses offer an option.

PPA's involve direct negotiation between providers and payors. Typically, a third party payor, insurer, or employer will negotiate daily hospital rates, physician charges, etc., with each provider (Trauner, 1983). The PPA

usually provides price discounts in return for guaranteed business. This arrangement is particularly attractive to providers in markets plagued with excess supply. Supplier incentives for increased efficiency result as various suppliers in a market compete by reducing prices.

PPA's provide appropriate contractual controls on prices and units of specific services used to produce each of the priced services efficiently. However, these contractual arrangements do not control the number of units supplied of each priced service. If hospitalization is priced on a per diem rate, the hospital will produce each day of care efficiently price will be determined efficiently, but the hospital has no incentive to reduce admissions or lengths of stay. Thus, one dimension of the contract remains incompletely specified as in the case of PPS's. None of these contractual systems provides for more complete control of the quality dimension than was available with the retrospectively priced fee-for-service system.

Less substantial changes have been made in the contractual arrangements between consumers and third party payors. The lack of an income effect and the low marginal cost of services provide only limited incentives for consumers to seek efficient providers. The tax treatment of premiums has not changed. Studies have found that co-payments and deductibles which increase the marginal cost of medical services to the consumer, also reduce the units of health services consumed.

Recent work by the Rand Corporation has overcome these shortcomings with controlled experiments. The Rand group (Newhouse, 1978; Phelps, 1982; and Phelps and Newhouse, 1972) found that 25% and 50% co-payments reduced average total ambulatory and hospital expenditures by 19% and 30%, respectively. Similarly, an income-related deductible and a flat $150 deductible that applied only to ambulatory care reduced average total expenditures by 31% and 23%, respectively. In all cases, the reductions in expenditures for ambulatory care were greater than those for hospital care. Contrary to earlier beliefs, reductions in expenditures for hospital care were significant and related mainly to reductions in admissions. The study reported no differences in cost per hospital admission.

Phelps (1982) argues that additional forms of cost sharing that would reduce health care expenditures include limiting the tax deductibility of employer health insurance contributions and including those premiums as taxable income to the employee. Phelps estimates that taxing half the private insurance premiums would reduce health care expenditures by $12-$13 billion. Of this reduction, expenditures for services provided by hospitals and physicians would decline by $7.6 and $3.8 billion, respectively.

These cost-sharing devices have a direct influence on providers. As consumers reduce their expenditures for health care, there is more competition among providers for

health care dollars. Consumers seek the most efficient health care providers.

CHANGES IN CONTRACTUAL CONDITIONS CHANGE AGENT ROLES

The major effect of the changes in contractual relationships between consumers, third party payors and providers, discussed in the previous section, is an alteration in the "agent-coordinator" role. The physician-agent has been in this role in the past but, as stated earlier, assumed little or no responsibility for the economic efficiency of his own production process or that of the providers of other medical services prescribed. Eliminating some or all shortcomings in previous contracts shifts financial risks to the agent-coordinator, placing economic constraints on the unit fulfilling that role (Evans, 1983). The physician may maintain the agency role of prescribing medical services purchased from the various provider levels to consumers. But the agent-coordinator role responsible for minimizing costs may be shifted by varying degrees to other units. A description of various models of contractual relations between third party payors and providers indicates how financial risks are shifted from third party payors to different provider levels, each having different effects on the traditional physician-agent role. These models are summarized in Figure 2.

In the first model, an independent third party payor contracts with each provider type - physicians, hospitals, skilled nursing facilities (SNF's), etc. In this example,

we assume that these contracts pay each provider a capitation rate based on the number of consumers entitled to services. If the capitation rates are competitively determined, each provider must maximize production efficiency to maximize economic surplus. In this model, the third party payor assumes the overall agent-coordinator role. The physician agent may continue to prescribe units of his own medical services and those provided by other provider levels, but is constrained by the agent-coordinator to prescribe them from specified providers.

In the second model, the third party provider is integrated with level one physicians. In the United States, physician group practices often form HMO's. This model combines the agent-coordinator role with the physician-agent role. The physician-agents continue to prescribe medical services supplied by other provider levels. However, unlike the previous model wherein an independent third party payor selected the other level providers, the physician-agent does so under economic cost constraints. This model provides the physician-agent with some direct controls over the quality of other providers.

In the third model, the third party payor is fully integrated downstream with all provider levels. All contracting with external provider levels is eliminated because these providers are under common ownership. The physician-agent role continues to be held by level one physicians, but the agent-coordinator role is fulfilled by

the system or unit as a whole. Each provider level has some influence over the decisions of the overall agent-coordinator, but is now responsible for its own provider function as well as for the efficiency of the unit as a whole. Unlike the second model wherein the physician-agents controlled the choice of other providers, in this model all providers have some authority over the choice of all other providers. This model also gives each provider internal control over the quality of all other providers.

These three models provide a limited sample of various relationships that are emerging from the changes in contractual relationships between consumers, third party payors and providers. Many other levels of integration between the first and third models are possible. Providers at any provider level could increase efficiency by integrating upstream, downstream, or horizontally with other providers. For example, hospitals that have signed a capitation agreement to provide services to a group of consumers could increase efficiency by integrating downstream with SNF and home health care providers or upstream with physicians.

In the next section, we will define various types of integration and discuss sources of gains in efficiency from a limited number of specific types of integration. However, the nature and extent of integration depends on the extent to which the traditional contractual conditions can be

changed to shift financial risks to providers. It is this shift that will incorporate economic constraints in the agent role and induce incentives for efficiency among providers.

TYPES AND SOURCES OF EFFICIENCY FROM INTEGRATION

In this section, we assume that changes in the economic system responsible for providing health care, whether that system is characterized by highly centralized planning or decentralized decision making, have been instituted that place economic constraints on consumers and health care service producers. These constraints require consumers to seek efficient producers. Various types and levels of producer integration may increase production efficiency. This section defines these types of integration and sources of gains in efficiency and describe specific examples of integration taking place in the United States.

Types Of Integration

Integration of provider units is occurring through horizontal, vertical and producer geographic market extension forms of growth. It is also occurring in various levels of completeness from short-term contracting between providers to complete ownership. Even though we describe all types of integration in this section, we will concentrate on vertical integration among health care providers wherein one provider type owns a provider in another stage of the production process.

Long-standing structural changes have generally involved horizontal growth of existing firms, i.e., expansion within generally homogeneous lines of business in the same geographic service area. These organizations achieve increased production efficiencies through economies of scale. Figure 3 depicts the historical growth of hospitals. Until recently this growth resulted from the expansion of bed capacity and services offered within existing general acute care hospitals. In the last decade, there has been substantial growth in proprietary and non-proprietary multi-hospital systems. Some of this expansion has been through mergers of hospitals located within the same geographic area (horizontal groups) whereas some has involved mergers of hospitals located in different market areas (geographic market extension).

Similarly, independent physicians have grown by forming group practices. Most of this growth has been within the same geographic market (horizontal). Often it has involved combinations of physicians with differing specialties. Generally, if these physicians are exclusively level one or level two providers, the growth is horizontal; if they combine level one and level two (tertiary care physicians), the growth is vertical or product extension.

Provider organizations are responding to the current health care environment by vertically integrating with other provider types. Vertical integration occurs when a provider expands de novo or acquires other health care input

suppliers who produce products or services that were purchased from or sold to others prior to integration. Examples of vertical integration include group practices or hospitals offering HMO's, hospitals merging with skilled nursing facilities, and providers self-insuring their malpractice claims. Other examples are shown in Figure 3. Because of poorly defined economic relationships between providers, in the past these linkages have not often involved the formal purchase or sale of services by providers at one production level to providers at other levels. These services were prescribed by the physician-agent. If economic interests are placed in an agent-coordinator, these producers, in reality, are included in the agency relationship, organized into a vertical production process.

These types of growth are summarized in Figure 3. A complete compilation of each form's extent of growth is not available. Ermann and Gabel (1984) compiled the extension summary of integration by multi-hospital systems shown in the Table. The activities listed do not always fit neatly into the traditional growth categories. For example, the expansion of hospitals into SNF's represents vertical growth to the extent that patients are transferred from one unit to the other. However, this might be considered product extension growth to the extent that some hospital patients do not use SNF's or vice versa. However, the activities listed do show evidence of hospital system growth into

virtually every aspect of health care and into many unrelated activities.

Sources of Gains in Efficiency

Each type of integration provides potential gains in efficiency. The sources of these gains in efficiency vary by the type of integration and the nature of exogenous conditions in the health care provider's market. Gains in efficiency from horizontal integration result when the firm achieves greater economies of scale. Therefore, the cost per unit of service produced declines as the firm expands output. The economies of scale result from factors such as increased specialization of functions within the provider unit and availability of more efficient technologies at larger scales of operation. Larger hospitals and group practices may be able to sub-divide various managerial functions efficiently, allowing them to hire more qualified administrators than is efficient for small hospitals and independent practitioners. Similarly, larger hospitals and group practices may be able to utilize accounting and data information system technologies that operate efficiently at large scales, but are not feasible on smaller scales.

Growth by geographic and product market extension provides potential gains in efficiency due to economies of scope. Whereas economies of scale result in expansion within a horizontally related line of business, economies of scope result from successfully taking advantage of joint cost opportunities. The capital input is a common example

of a source of economies of scope. A hospital may have access to capital at an efficient rate, but may not wish to use that capital for horizontal expansion, e.g., because the market may be adequately supplied with hospital beds. That capital may be more efficiently used to build or acquire hospitals in other markets or purchase providers at other levels of production, e.g., SNF, or home health care providers. In addition to being an outlet for excess capital funds, diversification and integration many reduce the financial risk associated with owning the hospital's capital instruments (stocks and/or bonds), thereby reducing the cost of capital to the integrated firm. Excess capacity in the marketing or any other function within the firm may be more efficiently utilized by expansion into other activities that can utilize these functions. There may be other inputs in the production of services that can be efficiently shared by provider types within and between the various provider levels.

Vertical integration has three potential sources of gains in efficiency.[1] First, gains in technical efficiency result from characteristics of the physical production process. The processing of iron ore into fabricated steel products provides an example of technical economies. Vertically integrating processing and fabricating levels eliminates the costs of reheating and cooling the product at each fabrication stage. In the health care sector, information describing a patient's health status provides a

[1] This section draws heavily from Williamson (1971)

similar example. Each provider level may need the patient's medical record. Contracts between providers could specify the transfer of that record between providers. However, that contract must specify that the information be transferred according to a common information system. It may be costly to establish the conditions of these contracts. Further, the contract must specify the information's level of the quality and provide for patient approval of the transfer of inforamtion. The difficulties of establishing these conditions, the latter of which are contractual costs, may make vertical integration a more efficient alternative. Technical economies may also result from cases in which a patient is having a procedure, e.g., surgery, conducted and another health-related problem is discovered that requires use of other provider specialists. Having direct access to those other providers may permit multiple procedures to be conducted with anesthesia or some other input administered only once.

Second, contractual costs provide a source of incentives for firms to integrate vertically and to increase efficiency. Contractual costs are incurred in the process of haggling over price, quantity and quality dimensions of the contract. Contracts providing transfer of medical records for the patient discussed earlier describe these costs. Further costs are incurred if once negotiated, the conditions of the contract permit moral hazard.

Third, vertical integration may result in information economies if redevelopment of the information at various procedure levels is eliminated. This elimnation permits the high fixed costs associated with information gathering to be spread over more units of output. Information economies also may result if parties negotiating a contract disagree on the interpretation of the information.[1] Examples of vertical integration induced by each of these sources of efficiency will be provided in the next section.

Examples of Various Types of Integration

A substantial amount of integration, much of which is vertical, is taking place among health care providers in the United States. General patterns of integration have been detailed in the Table. Some types of integration have existed long enough to provide evidence of increased levels of efficiency over non-integrated systems. Others are less extensive and more recent. In this section, we will describe specific cases of integration between various provider levels shown in Figure 2. In each case, the sources of savings will be discussed and, where possible, the levels of savings will be documented.

Third party payor-first level provider integration. Probably the most extensive and visible integration has occurred between third party payors and various levels of providers. In most cases, these integrated systems offer complete coverage of the enrollees' medical needs. By

---

1 Williamson, 1971, calls this problem "information impactedness".

bringing the insurance function and the medical provider function under common control, financial risks are shifted to providers and, thereby, generate incentives for efficiency. The extent of integration ranges from including only third party payors and level one providers, wherein contractual relations are established for services required from other level providers, to including almost all provider levels under common ownership as shown in Models 2 and 3 in Figure 2. The major gains in efficiency from this form of integration result from eliminating various contractual costs. We argued earlier that the nature of health care makes it difficult to specify limits to the three dimensions of contracts between third party payors and providers. The result of open-ended contracts has been moral hazard (Williamson, 1971). Integration between third party payors and level one providers induces level one providers to minimize costs, thereby reducing moral hazard. Another source of savings may result from eliminating the transaction costs involved in haggling over the contract conditions. The cost reductions from these sources will vary with the structural relations between the third party payment mechanism and the level one providers.

Integration between prepaid plans and level one providers has taken three general structural forms, two of which encompass forms of group practice. The staff plan employs physicians who provide services exclusively to HMO-plan enrollees. Staff physicians may be salaried as in

the Kaiser-Permanente Plan or compensated in whole or in part on a capitation rate as in Group Health Cooperative of Puget Sound. In the closed panel structure, group practice physicians enter into a contractual agreement to provide services to HMO enrollees while continuing to serve fee-for-service patients. As in the staff plan, physicians may be salaried or paid a capitation rate. However, in some closed panels where HMO enrollees make up a small percent of total patients served, the individual physicians are paid on a fee-for-service basis, although the panel is paid by a capitation method.

In the third structure, independent practice associations (IPA's) contract with independent physicians to provide services to enrollees. The IPA, if integrated, is owned by the independent physicians. Physicians may bill the IPA on a fee-for-service basis or share the IPA revenues on a capitation basis.

In any of these structures, the method of reimbursing physicians has an important effect on the extent to which incentives are changed by shifting risk to the HMO. The HMO will have minimal effect on physician behavior if physician salaries are based on production, i.e., number of services provided. Alternatively, if physicians receive salaries based on a capitation rate, costs from providing unnecessary services are minimized.

Integration between staff or group practice physicians and prepaid plans may have additional advantages over IPA's.

IPA's require that internal contracting be established between the "insurance" function and the independent physicians, each of whom may have different operating costs. These internal agreements are likely to be more difficult to establish than in group practices where each provider's operating costs are shared by all group members. Also, because the IPA involves physicians operating independent businesses in various locations who have developed a joint venture, it will be much more difficult to police free-rider problems in the IPA model than in the group practice model.[1]

Cost reduction from integration may also result from increased incentives to keep patients well. Recall that prepaid plans avoid the problems of specifying the coverage limits by covering all health care needs of enrollees. Therefore, physicians should practice more preventive medicine, assuming preventive services are less costly to provide than treatments for contracted health problems. Many groups have developed wellness programs. Examples are educational programs to lose weight, to stop smoking, and to exercise sensibly.

HMO's, common forms of prepaid health plans, are having a substantial impact on U.S. health care. In 1970, there were 33 HMO's in the United States serving approximately

---

[1] Free-rider problems exist when someone gains from the resource commitment of others without contributing proportional resources to the effort.

three million enrollees (National Industry Council for HMO Development, 1984). In 1983, there were 280 HMO's serving 12 million enrollees. HMO's have a market penetration of 33.7% in San Francisco, 26.4% in Minneapolis, 25.1% in Los Angeles and 23.4% in Portland. Only one metropolitan area with a population over one million is not served by an HMO. Numerous studies confirm the lower cost of HMO's.[1] Most cost savings relate to total health care expenditures, hospital admissions, and hospital length of stay (Luft and Trauner, 1981). Luft (1980) found total hospital days per 1,000 enrollees to be 35% lower for HMO than fee-for-service patients. Most of these reductions are due to reduced hospital admission rates. Hospital admission rates were found to be 20-40% lower for HMO enrollees (Luft, 1980), but length of stay was not found to be perceptively lower (Luft, 1980), (Arnould, DeBrock and Pollard, 1984). In another experiment in which self-selection was carefully controlled, researchers found that admission rates of HMO enrollees were 46% lower than fee-for-service patients. Some evidence indicates that HMO's devote more attention to preventive care. However, this incentive may be explained because HMO's cover preventive care whereas most fee-for-service plans do not, resulting in a real price change for HMO enrollees (Berki, et al 1977). Finally, Arnould, DeBrock and Pollard (1984) found that HMO's produce specific services more efficiently.

---

[1] For a detailed summary, see Luft (1981).

Looking at four surgical procedures, they found laboratory and radiology charges to be 31-47% lower for HMO patients for two procedures and gross charges to be 35% lower for one procedure. In no procedure was the charge higher. Richardson, Martin and Diehr (1984) conducted a comparative analysis of a staff plan and an IPA to determine if free-riders and utilization review problems are more difficult to control in IPA's. They found total costs, hospital admissions, and average lengths of stay adjusted per number of enrollees to be significantly lower for staff plans than for IPA's.

Clearly integration of the insurance and provider functions change provider behavior and reduces transaction costs resulting in significant gains in efficiency. One caveat is necessary. The HMO's included in the empirical evidence vary in degrees of integration. In some, integration is limited to third party payors and level one physicians; in others, integration encompasses all levels of providers. Thus, some cost reductions may be the result of integration among first, second and third level providers. Empirical evidence of gains in efficiency from integration among providers in these levels is not available.

Horizontal and vertical integration among first and second level physicians. The number of physicians organized into group practices in the United States has grown. In 1980, 26.2% of the physicians were in 10,762 group practices. The average group practice consisted of eight

physicians. By 1984, 29.3% of the physicians were in 15,485 groups[1]. The average group practice consisted of nine physicians. Some groups consist of level one physicians; others combine levels one and two providers. Gains in efficiency may result from economies of scale, reduced contractual costs and information economies. Economies of scale may result from the horizontal growth at various levels of the system. For example, if providers own a prepaid plan, economies of scale in the insurance function may dictate the size of the patient base and, therefore, the group practice necessary for the insurance function to operate efficiently. Economies of scale in the provision of insurance is well documented (Arrow, 1963).

Forming group practices reduces the number of contracts negotiated between providers; it also provides access to internal mechanisms to control quality and costs. Group practices may need to expand into other geographic markets to attract an adequate patient base that will support an efficient insurance function. Contracting with independent providers in various locations presents problems in quality and utilization control similar to those attributed to IPA's and non-integrated plans. To overcome these problems, providers are diversifying into new geographic markets. Kaiser-Permenente has physician staffs in 12 states and

[1] Information provided to authors by Medical Group Management Association.

hospitals in 22 cities. Level two physician centers are establishing satellite level one provider facilities to guarantee adequate patient base and to support the level two care center efficiently. Mayo Clinic, a level two physician group practice, has announced plans to develop satellite facilities in southern states. Carle Clinic, also a level two physician group practice, has satellites in a 50-mile radius of its tertiary care center and plans further geographic expansion.

Finally, information economies may be gained through group practices if the practice provides a common level and quality of information between level one and level two physicians.

Integration between level two and level three providers. This integration permits input factors to rearrange functionally and to respond more readily to the level of care required and the most cost effective means for its provision. The flow of patients from hospitals, nursing homes and home care services is not impeded in the short run by economic constraints and by each input provider's need to profit maximize if these facilities are vertically integrated. The relationship between acute care hospitals and skilled nursing facilities (SNF) has generally been on a referral basis. Hospitals had no incentive with retrospective fee-for-service reimbursement to transfer patients needing only limited care from the hospital to the SNF. In fact, with no restrictions on length of stay, the

hospital's incentive was to do the opposite. Hospitals reimbursed on capitation and payment per DRG can lower costs by reducing the hospital length of stay. Those patients continuing to need care can be transferred to a SNF where costs per diem average $46.00 in the United States compared with $368.01 for acute care hospitals. Patients needing lower levels of care than that provided by SNF's may be transferred to their homes and treated by home care agencies at even lower per diem costs.

All three provider groups exist in a variety of relations with each other. All exist as freestanding units. Nursing homes are owned by over 50% of the multi-hospital systems, and over 40% have home care agencies. In some cases, SNF's own home care agencies (Ermann and Gabel, 1984). In fact, 84% of the nation's home care agencies are owned by organizations other than freestanding visiting nurse associations, usually hospitals or SNF's (Lundberg, 1984). Clearly, these services could remain freestanding with patients attracted to them by referrals from physician-agents. This relationship may not provide unnecessary economic ties between the provider groups to promote efficiency.

Management service contracts are being used to establish contractual relationships between these providers in many cases. Other providers are finding a number of advantages from full integration into these areas. SNF's require long-term investments in capital facilities. It is

difficult for health care providers to develop satisfactory long-term contracts because they operate in an environment of rapid technological change where quality standards are difficult to establish and coordination is essential for cost efficiency. Profits or surpluses will be captured by the integrated system regardless of where the service is provided within the system. Thus, there are more incentives to provide the most appropriate care to meet patient needs in the integrated system than in a non-integrated system.

The contractual completeness in an integrated approach allows short-range efficiencies to accrue while the larger "system" attends to the longitudinal need for overall economic efficiency. In addition, greater flexibility exists in meeting external competitive pricing. The internal system has the ability to alter payment structures on a dynamic basis to meet market demand and to deter market entry (Schmalensee, 1973). Thus, temporal market and pricing varities can be effectively addressed without harm to the overall system. This ability is important to second and third level provider roles, which tend to be more capital intensive.

The creation of information sharing and processing systems is an essential element in the continued viability of integrated relationships. Data processing systems with high fixed costs can be expanded to encompass the information needs of each provider level at a relatively low marginal cost and with internal quality controls. More

complete information on operating costs allows the most prudent use and arrangement of inputs. Demand forecasting and modeling over a greater number of production units and inputs are facilitated and improve the overall predictability for services needed and resources required. Savings can occur through inventory control, variable staffing patterns and human capital transferability.

The common data base applied directly to patient care provides the physician agent with more integrated input information, which may have a positive impact on reducing duplicated services. The date base serves both as a source of quality control and peer evaluation and as a research base to track the efficiency of various inputs, configurations, and the quality of the results. Perhaps most importantly, an integrated system of financial and clinical data can be used to effect change. Objective data can be used by providers at all levels to evaluate the cause and effect of various resource consumption decisions. The data can assist in their decision making and balancing the interests of the individual patient and the economic interests of the system.

Quality of care may be enhanced through standardizing the procedures, training and equipment used among integrated providers. Standardization may also reduce input costs by increasing purchasing power. The ability for the patient to "transfer" information and procedures from the physician's office, hospital, nursing home and home may be a significant

factor in increasing patient compliance with prescribed interventions. Greater compliance may lead to greater clinical efficacy, thereby reducing overall resource consumption.

Integrated providers may be able to hire and retain more capable functional specialists through the ability to spread their knowledge and costs over a larger number of units. The improved forecasting capability of the system will expand the ability to plan the human resources needed and to develop methods for their recruitment and training. The health care industry's needs for human capital are growing both in the numbers and the skills required. An integrated system has the added potential to stimulate individual and system growth through the interaction of managers and providers at various levels. The structure of the interaction within an integrated system tends to promote more focused problem solving and a need to understand the point of view of different provider levels. The integrated system provides a built-in mechanism for individuals to change their "perceptual set" on how things can be done and begins to expand understanding on a system level.

Technical efficiencies may be gained through the availability of complimentary technologies. The juxtaposition of various imaging approaches such as computerized axial tomography (CAT) scanning and magnetic resonance imaging (MRI) allows their utilization on a timely basis. Integration permits the diagnostic process to be

done relatively at the same time as other procedures are conducted. Additional expensive hospital days can be avoided and patient inconvenience minimized.

Integration can insure referrals within the various sub-parts and allows priorities to be established. The assured access to regulated production inputs (nursing home ownership under Certificate of Need) is essential in priority setting and may avoid monopoly pricing (Vernon and Graham, 1971). The aggregation of similar inputs throughout the system may allow CON volume thresholds to be reached to gain access to or expand regulated activities. Specific exceptions such as HMO volume may also accrue to other system inputs. Lastly, the ability of an integrated system to move inputs from regulated to non-regulated provider levels (hospital services to physician offices) represents potential market and financial advantages.

Providers, mainly physician groups and hospitals, have integrated into various types of self-insurance. Typically, this self-insurance includes self-insurance of malpractice claims and employees' health care needs. Self-insurance against workmens' compensation has been practiced by many firms for several years. There are four ways in which self-insurance may result in lower costs. First, the cost of a malpractice liability will detract from the ability of the group practice or hospital to pay employees or engage in other necessary activities. This cost increases the incentives for the organization to develop stringent quality

controls. Peer pressure from those affected financially by the actions of individuals also will have an impact on quality control. Second, insurance fees are determined by group rating organizations. Organizations with better than average risk experiences subsidize those with worse than average experiences. Therefore, the former organizations can reduce insurance costs by self-insurance. Third, certain organizations may believe that their exposure to risk is less than it is perceived to be by the insurance market. This divergence of expectations may be due to straight forward differences in interpretation, to quality controls or to other limits on exposure the benefits of which cannot easily be conveyed to the private insurer. Again, if the hospitals' or group practices' interpretations of the information is correct, insurance costs will be reduced by vertical integration. Fourth, truly integrated insurance coverage may provide economies in combined legal representation. United insurance obviates the ability of the plaintiff's attorney to seek individual settlements and thereby increase the total settlement. The economic savings are difficult to project, but may be significant for cases involving large and complex litigation.

Finally, all these forms of integration have a common direction in the sense that the integration is encompassing those provider services being prescribed by a prescribing agent. In the traditional non-integrated system in the United States, the primary care physician served this agency

role. That agency role has been lessened by utilization review procedures enacted by other provider groups and by integrated systems in which an agent for the system looks over the shoulder of all provider types. This diversification also changes incentives of the different provider groups and captures clients of one provider for all elements of the system.

SUMMARY

Vertical integration has the potential to increase the efficiency of health care provision significantly. We have discussed types of integration that could increase technical efficiency, reduce contractual, information and transaction costs, and provide appropriate provider incentives. Most potential sources of cost savings can be found in planned economies as well as decentralized economies such as the United States. In fact, a centralized function in the United States, the methods used by the government as a monopsonistic purchaser of health care services, created many of the problems that retarded growth of integrated systems.

Vertical integration to provide more efficient production of health care services and coordination of patient needs is a relatively recent phenomenon in the United States. Therefore, we could provide only limited empirical evidence of its effects on health care costs. Those cost savings are substantial in some areas. The integration of the patient insurance function into the

provider functions is a case in point. The integration of hospitals, SNF's and home care agencies also provides a strong potential for large cost reductions due to the differences in daily costs among these units. However, no estimates are available of the potential reductions in lengths of stay at the higher cost facilities.

Although the forms of vertical integration discussed in this paper are occurring at a rapid pace and some evidence was provided of benefits from some forms of integration, there is contrary evidence within the same decentralized economic markets of the United States. For example, freestanding outpatient surgery centers and facilities which treat only obstetric and gynecologic cases are being constructed in many cities. Generally, this countermovement is occurring in localities where insufficient and/or inefficient facilities exist. However, even though more empirical evidence is necessary before passing final judgment on efficiency comparisons, most existing evidence suggests that some types of integration promote efficient, high quality patient care. The sources of other types of integration are dependent upon individual market conditions and characteristics of the vertical linkages yet to be discovered.

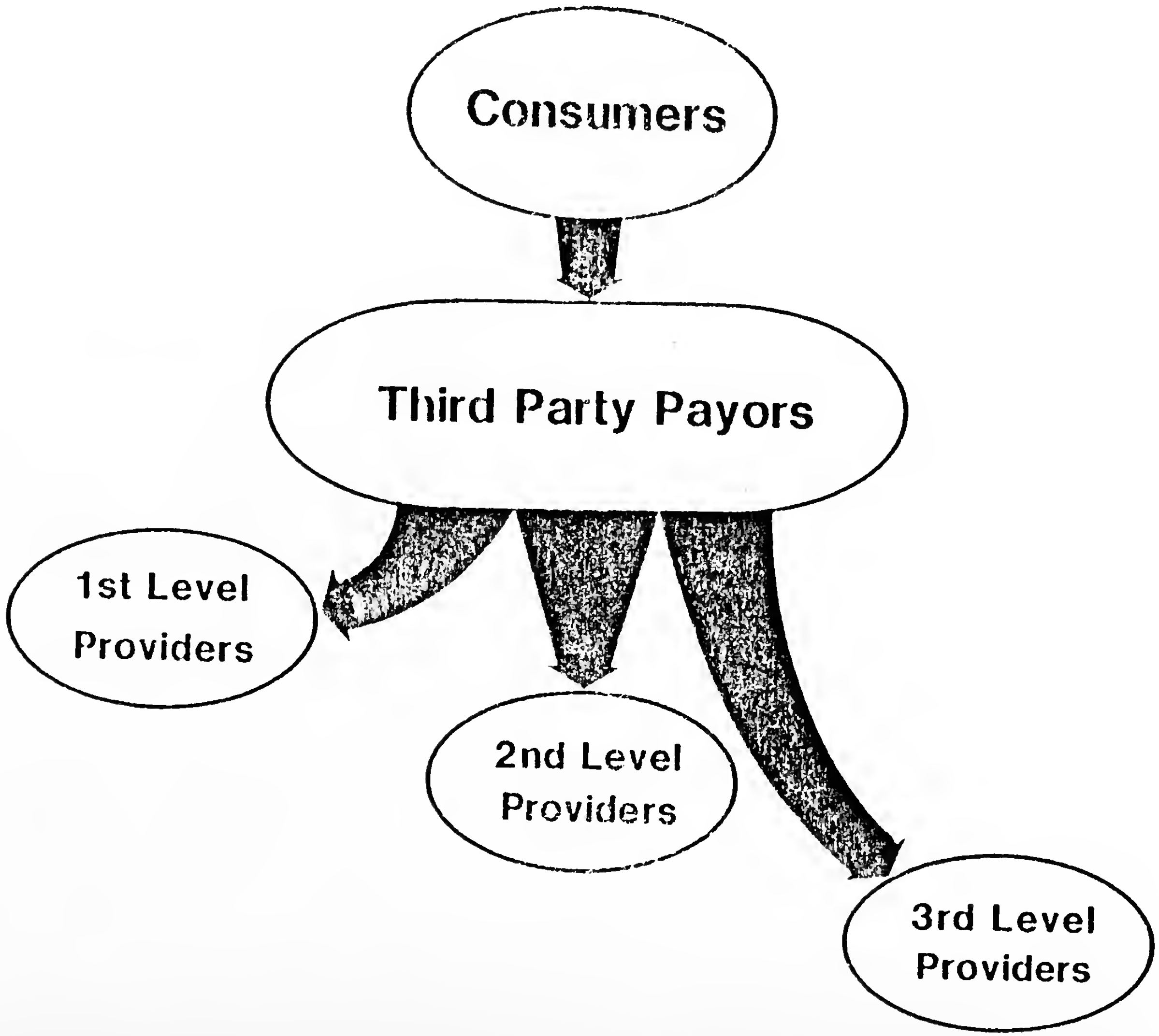
TABLE

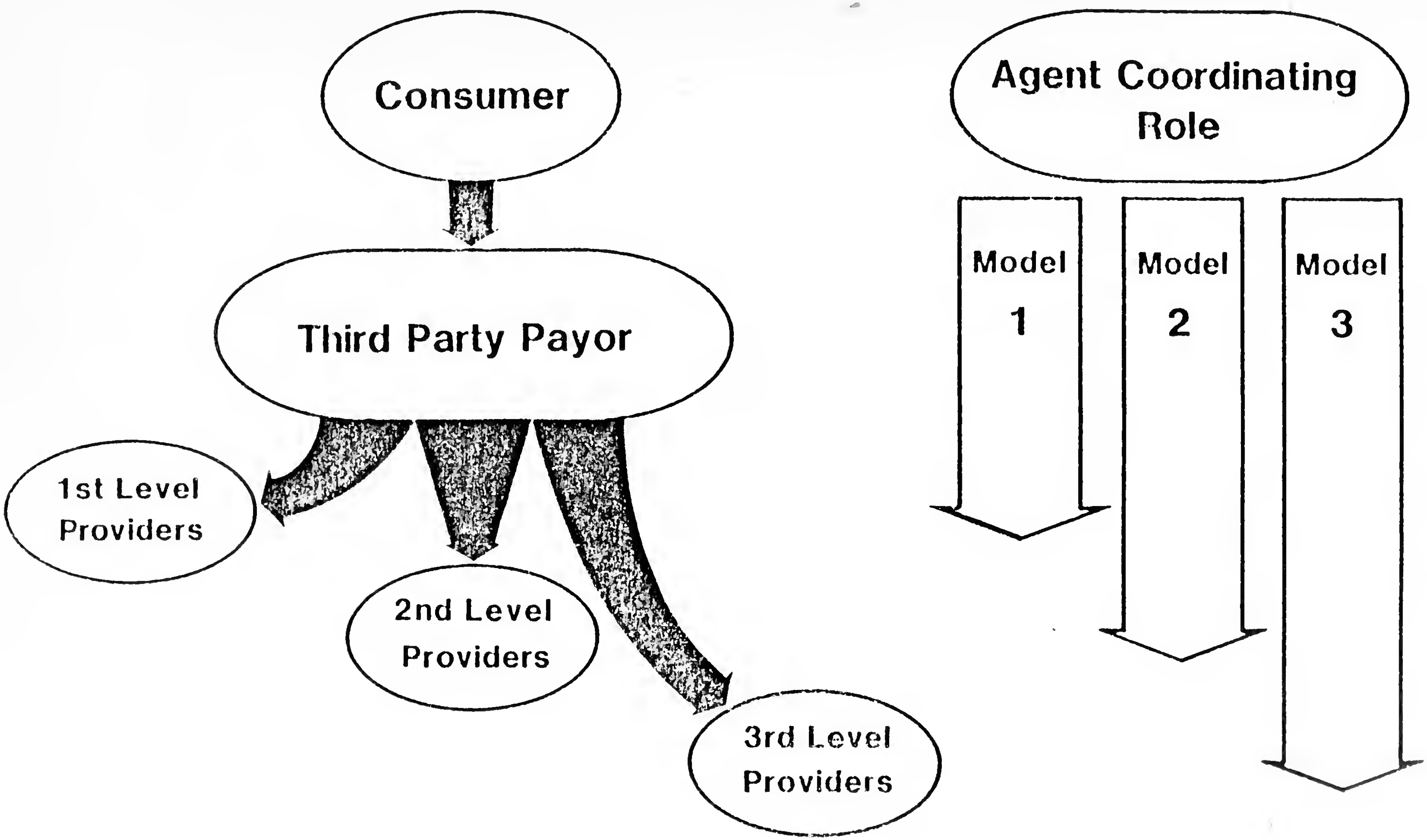
Percentage of Multihospital Systems Operating Health and Nonhealth Lines of Business, 1982

Line of Business	Percentage of Multihospital Systems Operating Health and Nonhealth Lines of Business, 1982
Health Care Services	
1. Health promotion programs	55.7%
2. Ambulatory care facilities	55.1
3. Nursing homes	50.6
4. Hospices	34.8
5. Alcoholism or drug treatment centers	33.8
6. Surgery centers	22.2
7. Ambulance companies	20.3
8. Convenience medical centers	18.4
9. HMO/IPA	12.6
10. Preferred provider organizations	11.4
Administrative Health Care Services	
1. Physician office buildings	71.8%
2. Group purchasing plans	57.5
3. Health care management consulting	43.0
4. Department management	26.6
Nonhealth Care Businesses	
1. Office building management	23.4%
2. Real estate development	21.6
3. Retirement settlements	14.6
4. Warehousing	13.3
5. Insurance company management	12.6
6. Hotel/restaurant/resort management	4.5

Source: American Hospital Association Survey of Multi-Hospital Systems: Executive Summary 1983.

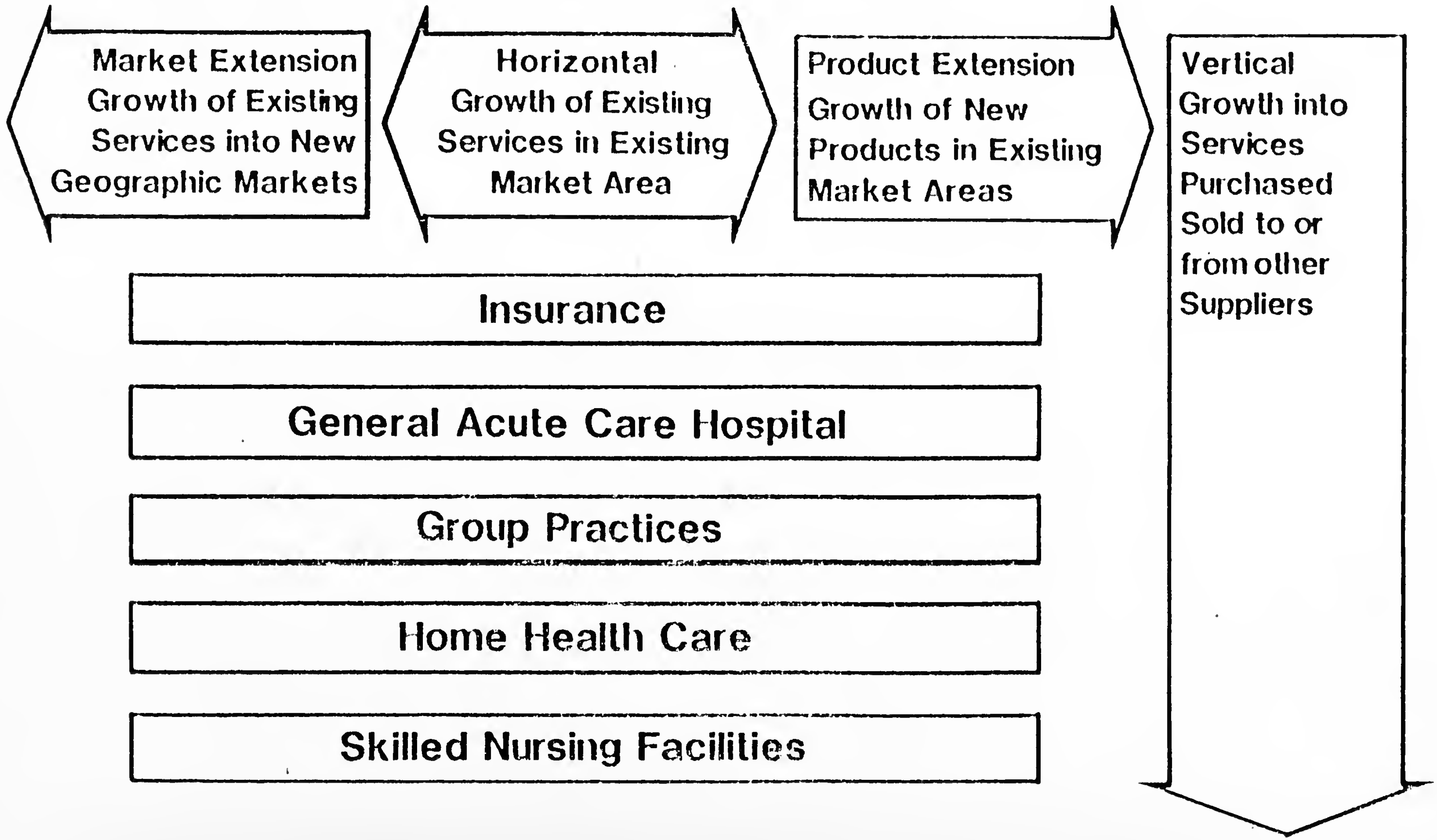
FIGURE 1


Consumers
Third Party Payors
1st Level Providers
2nd Level Providers
3rd Level Providers



Consumer
Third Party Payor
1st Level Providers
2nd Level Providers
3rd Level Providers
Agent Coordinating Role
Model 1
Model 2
Model 3

FIGURE 3


Market Extension
Growth of Existing
Services into New
Geographic Markets
Horizontal
Growth of Existing
Services in Existing
Market Area
Product Extension
Growth of New
Products in Existing
Market Areas
Vertical
Growth into
Services
Purchased
Sold to or
from other
Suppliers
Insurance
General Acute Care Hospital
Group Practices
Home Health Care
Skilled Nursing Facilities